CHAPTER 1

PROGRAMS, REPORTS, AND RECORDS

As you advance in the GS rating, you undoubtedly will find that much more of your time is spent in the training and administration of subordinates. This is as it should be, for knowledge must be passed from senior to junior. The most knowledgeable persons must be in charge. As a GS supervisor, you should not allow yourself to constantly be dragged into a maintenance position. If you do, your effectiveness as a leader will suffer. Weak leadership usually results in disharmony and, consequently, a poorly run, ineffective division or work center. This chapter addresses some of your administrative responsibilities as a First Class or Chief Gas turbine Systems Technician.

Administering and training subordinates on programs, reports, and records are never-ending responsibilities. Every day, whether you realize it or not, you administer people and programs and train junior personnel. You cannot have too much of either. (Although you can have too much paper work in your training and administration programs making them unmanageable.) Much of your training and administration is of an informal nature. A good leader uses good skills routinely and instinctively. However, formal programs in some areas of training do require more than instinct. Specific directives issued by superiors must be followed to conform to specific standards. Administration and training, whether formal or informal, are important responsibilities. They need to be taken seriously by all senior Gas turbine Systems Technicians.

TAG-OUT PROGRAM

An effective tag-out program is necessary because of the complexity of modem ships. Tag-out is also necessary to avoid the cost, delay, and hazards to personnel that could result from the improper operation of equipment. The purpose of the equipment tag-out program is to provide a procedure that prevents improper operation of components, equipment, systems, or a portion of a system isolated or in an abnormal condition. This procedure also should be used when other safety devices, such as blank flanges, are installed for testing, maintenance, or casualty isolation.

The use of **DANGER** or **CAUTION** tags is not a substitute for other safety measures, such as locking valves, pulling fuses, or racking-out circuit breakers. Tags attached to valves, switches, or other components should indicate restrictions on operation of systems or equipment, or restrictions necessary to avoid damage to safety devices. Never use danger or caution tags for identification purposes!

All procedures in the program are mandatory standardized tag-out procedures used by all ships and repair activities. The program also provides a procedure for use when an instrument is unreliable or not in a normal operating condition. It is similar to the tag-out procedure except that labels instead of tags are used to indicate instrument status. The tag-out program must be enforced during normal operations as well as during construction, testing, repair, or maintenance. Strict enforcement of tag-out procedures is required by both you and any repair activity that may be working on your equipment.

REVIEW AND MONITOR PROGRAM PROCEDURES

As stated in the previous paragraphs, strict adherence to tag-out program procedures is paramount. A brief description of the tag-out program was provided in the *Gas Turbine Systems Technician (Electrical) 3/Gas Turbine Systems Technician (Mechanical) 3,* volume 1. You should already know the program procedures as they pertain to the role of the maintenance person. Now as you move toward a more supervisory role, you will be required to have a much larger depth of knowledge. The one-sided program perception is in the past. You must now understand the program's inner workings to maintain a safe environment. A more detailed description of the required tag-out program procedures is provided in *Standard Organization and Regulations of the U. S. Navy,* OPNAVINST 3120.32 series.

REVIEW AND MONITOR PROGRAM EFFECTIVENESS

There are a couple of ways to review and monitor the tag-out program's effectiveness. The first of which

is pretty obvious. Were there any personnel injuries or damaged equipment because of violations to the tag-out program? This first method sounds good, but it is not always accurate. The second method (required) really does not take that much time if performed consistently. Use of the second method also will ensure that personnel injuries and equipment damage do not occur. What method are we referring to? It is the audit portion of the program.

As a maintenance person you probably were not concerned with the audit portion of the program. That is, unless there was a discrepancy found on an equipment tag-out that you were responsible for. But now as a GS supervisor your responsibilities have changed. You will probably be in charge of a work center, and as you continue to progress you will probably qualify as an EOOW/EDO. Eventually you will be required to know all aspects of the program. Now take a look at how tag-out audits should be conducted.

All tag-out logs (records) must be kept in the space(s) designated by your ship's instruction. Normally, these records for the engineering department will be kept in the central control station (CCS). Supervisory watch standers (EOOWs/EDOs) must review these records as part of the watch-relieving process.

Checks and audits of all tag-outs must be conducted every two weeks. However, these requirements may be superseded by your type commander (TYCOM) or even your own ship's instruction. Remember, just as with PMS, audit frequency can only be increased, not decreased.

1. All outstanding tags listed on the Tag-out Record Sheet must be checked as correctly installed by visual comparison of the information on the tag, the record sheet, and the item on which the tag is posted. when a valve or switch position is prescribed, a visual check that the item is in its proper position is made unless an operation such as removal of a cover, cap, or closure is required. No operation of a valve or switch is authorized as part of a routine tag-out audit. In addition, a spot check of installed tags should be conducted to ensure that tags so checked are effective (that is, covered by an active Tag-out Record Sheet). Report all discrepancies in the check of actual position at once to the EOOW/EDO before proceeding any further with the tag audit. The date, time, discrepancies (including corrective actions), and signature of the person conducting the check is logged on each Tag-out Record Sheet under the last tag listed.
2. When the actual position of a DANGER-tagged valve is in question, the EOOW/EDO, with the specific permission of the responsible department head, if available, may authorize two people to independently check the position of the specific valve(s).

NOTE

Checking the position of a valve is done only by attempting to turn the valve handwheel/operator a small amount in the SHUT direction.

This is an approved exception to the prohibition on operation of DANGER-tagged equipment. This valve position check must be performed using the applicable approved procedures for valve lineup checks.

3. All outstanding Tag-out Record Sheets are audited against the Index/Audit Record section. As part of the audit, each Tag-out Record Sheet is checked as previously specified. The date, discrepancies noted, and signature of the person conducting the audit are logged by a line entry in the Index/Audit Record section of the tag-out log.
4. Checking the installation of instrument labels and auditing the logs must be conducted in the same manner as a tag-out audit.

To ensure that tag-out/label procedures are enforced properly, the cognizant department head (engineer officer) frequently checks the tag-out log, notes errors, and brings them to the attention of those responsible. The completed Tag-out Record Sheets and Instrument Logs are removed by the department head (engineer officer) after the review.

Remember, a violation of any tag compromises the entire tag-out system and could in itself have serious consequences.

All loose tags that have been removed must be destroyed.

ENVIRONMENTAL POLLUTION CONTROL PROGRAM

As the Navy and our country progress into the 21st century, a much needed and stronger emphasis has to be

placed on environmental pollution control. For us to preserve our environment and our remaining resources, we must all be conscientious participants. The Navy is committed to operating its ships and shore facilities in a manner that is compatible with the environment. It is your responsibility as a supervisor to provide leadership and personal commitment to ensure that your personnel develop and exhibit an environmental protection ethic. Since this program contains such a vast amount of information and guidelines, we will not be able to cover more than a small part of the information. For a more comprehensive look at this program, read OPNAVINST. 5090.1.

MONITOR PROGRAM OPERATIONS

Monitoring the environmental pollution control program's operations is very important. This process can be very time consuming if proper training of all personnel is not done. As previously stated, this is not a one person program. It will take everybody's efforts to make it work.

Due to the large impact of any noncompliance, there are outside activities such as the Environmental Protection Agency (EPA) to monitor your program operations. Remember, most environmental statutes impose criminal liability for willful or knowing violations. In some cases, **individual service members** may be charged with criminal liability if their actions, or inactions, meet the requirements for imposing liability.

In the remaining segments of this section we will discuss some training tips and drill scenarios you may wish to use to better acquaint yourself and your personnel with this program.

TRAINING AND DRILL EVALUATION

This section provides some useful lesson plans, training tips, drill scenarios, and evaluation grading forms for hazardous material spills. Figure 1-1 is a sample lesson plan you can use to instruct personnel on response procedures for hazardous materials spills.

SAMPLE RESPONSE DRILL LESSON PLAN

LESSON TOPIC: HAZARDOUS MATERIAL SPILL RESPONSE/DRILL

AVERAGE TIME: 60 minutes (add 18 minutes for the videotape)

REFERENCES:

1. OPNAVINST 5100.19B, chapter B3, appendix B3-A
2. DOT Emergency Response Guidebook (if available)
3. OPNAVINST 5090.1A, chapter 17, Pollution Abatement Afloat

TRAINING AIDS:

1. Handout #1 Hazardous Material Spill Response Procedures (fig. 1-13, found at the end of this chapter from OPNAVINST 5100.19B, appendix B3-A)
2. Videotape "Shipboard Hazardous Material Spill Response and Cleanup," 803492-DN
3. Repair-locker materials and protective clothing from chemical handling areas or Hazardous Material Spill Response Kit, AEL 2-550024007
4. Damage control training team (DCTT) spill scenarios

OBJECTIVES:

The student should understand the special response procedures necessary to handle hazardous materials spills. The student should be able to demonstrate, or observe, response personnel donning protective equipment and cleaning up a simulated hazardous material spill.

Figure 1-1.—Sample lesson plan.

TARGET AUDIENCE:

All fire parties, damage control personnel, fire marshals, gas free engineers, gas free petty officers, rescue and assistance details, and command duty officers

REQUIREMENT:

Initial and annual training, with drill, according to OPNAVINST 5100.19B.

INTRODUCTION:

There are significant hazards associated with handling hazardous materials under a controlled situation, even more during a spill or emergency situation. A hazardous material spill can be a threat to the safety of the ship, the environment, and personnel. Users can usually handle small spills, less than 5 gallons of low toxicity material. Material safety data sheets (MSDSs) provide spill cleanup information. Larger spills of highly toxic, flammable, or explosive material can cause extensive damage to the ship and personnel injuries. As with any threat to the ship, damage control teams are tasked with responding and handling the emergency.

I. BACKGROUND

A. The Navy has established the Hazardous Material (HM) Program to provide the precautions and procedures to safely handle these materials.

B. Steps must be taken to prevent hazardous material spills from occurring.

1. The HM coordinator, along with the DCA, pinpoint those places aboard ship that are potential spill areas.

2. Potential spill areas include storerooms, stores-handling elevators and conveyers, crane-handling areas, in-use storage areas, sumps and tanks, and certain evolutions, such as UNREP/RAS, when spills may occur.

3. Periodic checking of these areas, especially after heavy weather, may alert you to a spill.

4. Environmental contamination of navigable waterways must be prevented!

C. Spillage, or accidental release of hazardous materials, must be handled with the proper protective clothing and with the correct procedures to avoid personnel injuries and damage to the ship.

1. Damage control personnel, CDOs, fire marshals, gas free personnel, and the DCA must be trained in spill response.

2. An annual spill response drill must be conducted.

3. Each member of the damage control team must be aware of the potential hazards of hazardous material spills. They must handle each spill as a special case. The DCA, CDO, or fire marshal will evaluate the spill and instruct team members in cleanup procedures.

4. Spills of oil, OTTO fuel, PCBs, radioactive material, mercury, CHT, and hydraulic fluid are handled by separate instructions. Specialized spill kits are available for each of these items, and trained spill teams generally respond to these types of spills.

5. Damage control personnel may be called upon to respond to spills of paint, thinner, dry-cleaning fluid, lube oil, acid, boiler water and feedwater chemicals, or laundry products.

Figure 1-1.—Sample lesson plan—Continued.

SHOW VIDEOTAPE "Shipboard Spill Response and Cleanup," IF AVAILABLE.

II. PHASES OF SPILL RESPONSE

A. DISTRIBUTE HANDOUT #1 Hazardous Material Spill Response Procedures (Handout #1, fig. 1-13, is found at the end of this chapter.)

As you can see on your handout, there are nine phases of spill response. They are similar to every damage control response, such as fire, flooding, or toxic gas. These phases do not always occur in order, and some may occur simultaneously.

B. Each of the nine spill response phases will be discussed in detail in this lesson plan and the handout. The phase names and the order of presentation are as follows:

- Discovery and notification
- Initiation of action
- Evalution
- Containment and damage control
- Dispersion of gases and vapors
- Cleanup and decontamination
- Disposal of contaminated materials
- Certification for safe re-entry
- Follow-up reports

1. SPILL DISCOVERY AND RESPONSE NOTIFICATION

a. Spills are discovered during zone inspections, by detection devices such as alarms, during routine operations, or safety surveys.

b. Early detection is critical! Leaking boxes, the sound of broken glass, seepage around barrel rims, unusual odors, or missing caps can be indicators of a spill.

c. Anyone can discover a spill. Everyone should be trained to notify their supervisor if they discover a spill.

- NEVER touch the spilled material.
- Evacuate the area and keep passersby from entering the spill site.
- If the situation is a severe hazard, or if you cannot reach your supervisor, contact damage control central (DCC) or the quarterdeck.

d. The person reporting the spill should report the same type of information you would report in case of fire or flooding:

- Time of spill discovery
- Location of the spill, by compartment name and compartment number
- Type of material spilled, if known
- Behavior of the material (Is it heading for a deck drain? Is it giving off thick red gas? Is it still spilling out of its container?)
- Source of the spill (such as a 55-gallon drum, 5-gallon can, tank, or pipe)

Figure 1-1.—Sample lesson plan—Continued.

- Any personnel injuries or witnesses?
- How much material is spilled, how many gallons, how many square feet on the deck?

e. DCC needs as much information as possible to decide who to send to the scene. For example, a 5 gallon can of paint thinner was dropped down a ladder near a storeroom. The can burst open when it hit the deck. The vestibule has no ventilation and the flammable vapors are building. In response to this spill, the DCA may want to send the entire fire party with charged fire hoses to the scene. The DCA needs specific information to make proper decisions.

2. INITIATION OF ACTION

a. The most important initial actions are to evacuate personnel, secure power to the affected area (if material is flammable), and call away a medical emergency for any injured personnel.

b. Block off the area until help arrives.

c. The DCA, CDO, fire marshal, repair locker leader, scene leader, or other authority will stabilize the situation before thinking about the cleanup. Stabilization may include securing deck drains, securing ventilation, setting spill boundaries, and staging backup personnel.

d. Once the situation is stable, injured personnel have been removed and cared for, and there is no immediate threat of fire or explosion, then the authorities can consider their next step.

3. EVALUATION

a. The medical department representative and the HM coordinator must have an MSDS for every hazardous material held on board. Each CDO, DCA, fire marshal, and key player must know where to find these MSDSs and how to use them.

b. These MSDSs provide specific spill and hazard information for the spilled item. The MSDS will tell if the item is corrosive, gives off toxic fumes, or reacts with nearby substances. In trying to decide how to handle and cleanup the spill, the MSDS information is critical.

c. Part of an evaluation may take place during the initiation of the action phase. The remainder may take place during the next phase of containment and damage control.

4. CONTAINMENT AND DAMAGE CONTROL

a. During this phase, the CDO, DCA, fire marshal, or scene leader decides if a Red Devil blower is needed for ventilation, and if any further damage control actions, beyond the initial action, is needed.

b. The decisions are made, based on the MSDS, what type of protective equipment is needed, and who will dress-out to approach the spill.

c. Barriers of sand, absorbent, blankets, or paper toweling maybe placed around the spill to prevent spreading.

d. The gas free engineering petty officer maybe required to determine explosive levels and levels of toxic gas.

Figure 1-1.—Sample lesson plan—Continued.

5. DISPERSION OF GASES AND VAPORS

a. Ventilation from the surrounding area, a Red Devil blower, ram fan air mover, or local exhaust system may be used to reduce explosive levels, or to disperse or dilute air contaminants.

b. Take care when exhausting vapors and gases to the weather decks to prevent re-introducing them into the ship.

c. The gas free engineering petty officer uses meters and Draeger tubes to check for ventilation.

6. CLEANUP AND DECONTAMINATION

a. Once the initial phases are complete, the team can take its time cleaning up the spill and decontaminating the area. Remember that cleanup personnel must be appointed and supervised as they don the required protective clothing. Protective clothing is provided in each ship's spill cleanup kit, kept in or near a repair locker.

Note to the instructor: If your ship has the spill cleanup kit available, breakout the kit and show all the components to the students. Explain the use of each item.

b. During cleanup and decontamination, one person supervises the cleanup while the others assist. The DCA, CDO, fire marshal, or scene leader will decide what protective clothing and respiratory protection is required and instruct the team members in the cleanup.

7. DISPOSAL OF CONTAMINATED MATERIALS

a. All the spilled material, absorbent, disposable clothing contaminated with the spilled material, and items which cannot be decontaminated are considered used hazardous material. These items must be double-bagged in plastic or placed in an empty drum or barrel and sealed. The material must be labeled with a hazardous chemical label. The material must then be turned over to the supply department for disposal.

b. You must decontaminate reusable items, such as rubber boots, dustpans, brooms, and mops before reuse. Place them in a doubled, plastic, labeled bag until you can accomplish the decontamination. The safety officer or the HM coordinator will help decide how to safely decontaminate reusable spill equipment.

8. CERTIFICATION FOR SAFE REENTRY

Once the decontamination is completed, the CDO, DCA, or fire marshal inspects the area to be sure the cleanup is complete. If toxic gases or vapors were involved the area also may need to be cleared by the gas free engineer.

9. FOLLOW-UP REPORTS

a. The spill response should be logged in the DCC log (Engineering Log) and the ship's deck log.

b. The CDO may want a written report to present to the CO or XO. Give a copy of this memo to the HM coordinator.

c. If there was local press interest, or if the spill caused fatalities or excessive damage, an OPREP-3 is probably required. Spills, such as oil, mercury, and PCBs have their own reporting requirements.

Figure 1-1.—Sample lesson plan—Continued.

(1) OPNAVINST 5090.1A provides hazardous materials spill response and reporting procedures for spills over the side, in Navy, non-Navy, and foreign ports. Report formats are provided.

(2) Any environmentally significant spill requires an OPREP-3 report.

d. Mishap reports to the Naval Safety Center are only required if the hazardous material exposure required medical treatment, resulted in five lost workdays, or caused a death.

III. HAZARDOUS MATERIAL SPILL DRILLS

Hazardous material spill drills must be conducted at least annually. These drills are in addition to the already required mercury spill drills, OTTO fuel spill drills, and others required by separate directives. The drill should be realistic and related to the ship class. The DCTT should develop spill drill scenarios involving the entire fire party.

SUMMARY:

Hazardous material spills may become damage control situations that threaten the ship and personnel. Damage control parties must be aware that, although similar to other damage control situations, spills may require special handling and precautions because of the chemical involved. Damage control personnel must be trained and drilled to understand hazardous material spill response procedures.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B, APPENDIX B3-A.

SPILL RESPONSE SCENARIOS ARE PROVIDED. SELECT ONE FOR A HAZARDOUS MATERIAL FREQUENTLY USED ON BOARD (MSDS AVAILABLE) OR DEVELOP YOUR OWN DRILL.

Figure 1-1.—Sample lesson plan—Continued.

HAZARDOUS MATERIAL SPILL RESPONSE DRILL SCENARIOS

The following sample hazardous material spill response drill scenarios (fig. 1-2) have been collected from several ships. The DCTT should review and discuss these scenarios for applicability to your ship. Each drill should involve as many actions as possible. Walk through the scenario first to train personnel before conducting a complete drill. Each duty section and all CDOs and fire marshals should observe or participate in a hazardous material spill drill. If available, use your ship's spill response kit.

Other scenarios could include a crane delivering a pallet load of paint breaking over the helo deck and spilling; several 5-gallon cans of ammonia floor wax stripper breaking free during heavy weather and spilling in a berthing area; or a 50-pound container of powdered citric acid falling in the engine room and breaking open, spilling the powder into the bilges and over two levels of deck grating. Be creative, but realistic.

Gasoline Spill

Figure 1-3 is a sample of a training drill scenario and evaluation sample for a gasoline spill drill. This scenario, like all others, should be tailored to meet the needs of your ship. The purpose of this sample is to provide you, the supervisor, a practical way to initiate the drill and to monitor and evaluate your response team's abilities. Keep in mind, the maximum credit points are arbitrary. You should assign point values based on the importance of each task being performed.

SCENARIO #l

An Engineman is removing a 12-volt battery from the motor whale boat. The boat is on the davit, and the Engineman must carry the battery down the side ladder. As he lifts the battery over to the side of the boat, his glove slips, and the battery falls about 10 feet to the deck below. The battery caps fly off and about 2 quarts of battery acid spill on the deck The acid is flowing toward the deck edge and scupper over the side. A nearby Boatswain's Mate tries to set the battery up to stop the spill and suffers acid burns on his hands.

This spill will involve:

—A medical emergency for acid bums

—Stopping the spill from spreading

—Using baking soda to neutralize the acid around the battery, and using personnel protective equipment to pick it up and bag it

—Spreading baking soda and scrubbing the spill area

—A fire party to charge hoses and dilute the acid while washing it over the side

—Personal protective equipment that would include rubber boots, rubber gloves, a rubber apron, and goggles (a respirator may not be required)

The used hazardous material would include the broken battery and any contaminated containment materials. The acid spill should be neutralized before washing it over the side. The alternative is to neutralize with baking soda and absorbing it up with towels, absorbent, or other material. All this would be bagged as used hazardous material.

SCENARIO #2

An SK3 went down to the flammable liquid storeroom to break out a 5-gallon can of paint thinner (flash point less than 100 degrees). As he carries this can up the ladder, the handle breaks off the can, and it falls down to the bottom of the ladder. As the can hits, the cap pops off and the contents spill. The vestibule is small and there is no ventilation in the ladder well. The SK3 tries to go down after the can, and while trying to right the can, replace the cap, and cleanup the spill, falls unconscious in the thinner. A sailor in a space above smells the strong vapors and phones DCC to get the fire marshal to investigate. The sailor and the fire marshal find the unconscious SK3 and see the spilled paint thinner in the vestibule.

This spill will involve:

—Explosive vapors and the need to secure sources of ignition.

—A medical emergency with the SK3 overcome by the vapors and skin contact with the chemical. A rescue would require respiratory protection but not an OBA due to flammable vapors.

—Ventilating the area with a Red Devil blower.

—Calling away the fire party in case of explosion and fire.

—Gas-freeing the area.

—Dressing out two people in goggles, organic vapor respirators, rubber boots, rubber gloves, and disposable coveralls.

—Cleaning up the spill using absorbent, double plastic bagging, and marking the material as used hazardous material.

—Decontamination of the area with soapy water.

Figure 1-2.—Response drill scenarios.

GASOLINE SPILL DRILL

OBJECTIVE: To train damage control personnel in spill cleanup procedures and equipment use.

APPLICABILITY: All

SUPPORT SERVICES REQUIRED: None

ACCEPTABLE EQUIVALENCY As approved by ISIC

REQUIREMENTS: None

SCENARIO I: Ship in port. MOGAS piping failure leads to 500-gallon spill in the pump room.

SCENARIO II: Ship undervay. Misalignment of valve causes 25-gallon spill through vent into pump room.

PROCEDURES:

1. INITIAL PROCEDURES:

   a. Spill stopped and reported to DCC

   b. Ship to General Quarters

   c. Spill reported via OPREP-3, Navy Blue or Unit SITREP, and Oil Spill Report, OPNAVINST. 5090.1

2. DAMAGE ASSESSMENT:

   a. Isolate area electrically and otherwise.

   b. Break out free-fighting equipment and prepare to combat fire and explosion.

   c. Determine gasoline vapor concentration in the air as related to the lower explosive limit. Select protective equipment and clothing based on this finding.

3. REPAIR TASKS:

   a. Breakout spill cleanup equipment and stage materials in the local area.

   b. Dress out personnel in appropriate protective equipment provided in the spill cleanup kit. In concentrations above the LEL, self-contained breathing apparatus (SCBA) should be used, if available, vice OBAs.

   c. Contain spill using diking materials or other equipment.

   d. Stage equipment and materials to maximize efficiency separating contaminated materials for final disposal.

   e. Commence cleanup operations using absorbent pads and other equipment.

   f. Collect contaminated materials for reuse or segregate for disposal.

   g. Continue cleaning until no visible sign of liquid is present and vapor concentration levels are below 10 percent of the LEL.

   h. Containerize contaminated materials in preparation for transportation and disposal. Sealed containers of gasoline contaminated materials may be explosive and highly flammable. The materials should be removed from the ship by the quickest available means including jettisoning overboard.

   i. Restore unused materials.

   j. Decontaminate personnel and equipment..

   k. Package residual contaminated material for disposal.

   1. Stow equipment and unused materials in spill kit and return kit to storage.

   m. Make follow-up reports via appropriate message.

SAFETY: Ensure the safety of all personnel and equipment.

Figure 1-3.—Spill drill for gasoline.

MARKING FACTORS

1. Preparation. Evaluate adequacy of preparation including but not limited to the following:

	MAXIMUM CREDIT	SCORE
a. Spill cleanup kit available	5	
b. Spill contingency plan available	5	
c. Spill cleanup team briefing adequate	5	
2. Damage Control Organization:		
a. Spillage reported efficiently	5	
b. Immediate response adequate	20	
c. Message notification adequate	5	
d. Spill cleanup personnel level of knowledge in:		
(1) Use of equipment	10	
(2) Use of materials	10	
e. Speed and efficiency of the cleanup operation	20	
f. Safety of personnel throughout all aspects of the operation	15	

MAXIMUM SCORE 100
TOTAL SCORE ___

Figure 1-3.—Spill drill for gasoline—Continued.

Oil Spill

Figure 1-4 is a training scenario and evaluation sample for an oil spill drill. Remember, this is only a sample and should be tailored to suit the needs of your ship.

Freon Spill

Figure 1-5 shows a sample of a freon spill drill. The purpose of this sample is not to limit you, but to encourage you to create your own viable scenarios.

PREPARE REPORTS

For all practical purposes, you probably will not be responsible for the actual reports that will be sent to your command's higher reporting authority. But keep in mind, you probably will be tasked with providing your superiors with the preliminary data. For you to be effective in this task, you should be familiar with the reporting procedures outlined in OPNAVINST. 5090.1 series.

ENGINEERING OPERATIONAL CASUALTY CONTROL (EOCC) MANUALS

The casualty control portion of the EOSS contains information relevant to the recognition of casualty symptoms and their probable causes and effects. This is also a source for information on actions to be taken to prevent a casualty. The EOCC manuals specify procedures for controlling single- and multiple-source casualties.

Casualty prevention must be the concern of everyone on board. Proper training of all personnel must provide adequate knowledge and experience in effective casualty prevention. The EOCC manuals have efficient, technically correct casualty control and prevention procedures. These procedures relate to all phases of an engineering plant. The EOCC documents possible casualties that may be caused by human error, material failure, or battle damage. The EOCC manuals describe proven methods for the control of a casualty. They also provide information for prevention of further

OIL SPILL DRILL (OVERBOARD)

OBJECTIVE: To train damage control personnel in spill cleanup procedures and equipment use.

APPLICABILITY: All

SUPPORT SERVICES REQUIRED: In port: Port Services punts and oil boom
Not in port: None

ACCEPTABLE EQUIVALENCY: As approved by ISIC

REQUIREMENTS: OPNAVINST 5100.19B requires one drill of this type per year.

SCENARIO I: Ship moored at pier inadvertently releases 1,000 gallons of fuel.

SCENARIO II: Ship at anchor inadvertently releases 1,000 gallons of fuel.

PROCEDURES:

1. INITIAL PROCEDURES:
   a. Continued spillage stopped
   b. Ship reports spill via OPREP-3, Navy Blue or Unit SITREP, and Oil Spill Report, OPNAVINST. 5090.1
   c. Review the ship's spill contingency plan
   d. Brief spill cleanup team
2. DAMAGE ASSESSMENT:
   a. Determine environmental significance of spill
   b. Determine volume of spill:
      (1) Within ship's capability, clean, designate personnel, break out spill cleanup kit, and launch small boats as necessary
      (2) Beyond ship's capability, take immediate action to control spill and request assistance by message from the designated naval on scene coordinator (NOSC)
3. REPAIR TASKS:
   a. Breakout spill cleanup equipment and stage materials in small boats
   b. Dress out personnel in appropriate protective equipment provided in the spill cleanup kit
   c. Launch small boats
   d. Contain spill using booms or other equipment
   e. Stage equipment and materials in the small boats to maximize efficiency
   f. Separate contaminated materials for disposal
   g. Commence cleanup operations using absorbent pads, skimmers, and other equipment
   h. Collect contaminated materials for reuse or segregate for disposal
   i. Continue cleaning until no sheen is apparent on the surface of the water
   j. Seal contaminated materials in preparation for transportation and disposal
   k. Restore unused materials
   1. Retrieve small boats

Figure 1-4.—Spill drill for oil.

m. Decontaminate personnel and equipment

n. Package residual contaminated materials for disposal

o. Stow equipment and unused materials in spill kit and return kit to storage

p. Make follow-up reports to NOSC via appropriate message formats in OPNAVINST 5090.1

SAFETY: Ensure the safety of all personnel and equipment.

MARKING FACTORS

1. Preparation. Evaluate adequacy of preparation including but not limited to the following:

	MAXIMUM CREDIT	SCORE
a. Spill cleanup kit available	5	
b. Spill contingency plan available	5	
c. Spill cleanup team briefing adequate	5	
2. Damage Control organization:		
a. Spillage reported efficiently	5	
b. Immediate response adequate	20	
c. Message notification adequate	5	
d. Spill cleanup personnel level of knowledge in:		
(1) Use of equipment	10	
(2) Use of materials	10	
e. Speed and efficiency of the cleanup operation	20	
f. Safety of personnel throughout all aspects of the operation	15	

MAXIMUM SCORE 100
T0TAL SCORE ___

Figure 1-4.—Spill drill for oil—Continued.

damage to components, the system, or the engineering plant.

The EOCC manuals are available to personnel in their own machinery space so that they can be used as a means of self-indoctrination. These manuals also can be used to improve casualty control procedure techniques for all watch standers. The manuals contain documentation to assist engineering personnel in developing and maintaining maximum proficiency in controlling casualties to the ship's propulsion plant.

Proficiency in EOCC procedures is maintained through a well-administered training program. Primary training concentrates on the control of single-source casualties. These are casualties that may be attributed to the failure or malfunction of a single component or the failure of piping at a specific point in a system. Advanced training concentrates on the control of multiple casualties or on conducting a battle problem. An effective, well-administered EOCC training program must contain, as a minimum, the following elements:

FREON SPILL DRILL

OBJECTIVE: To train damage control personnel in spill cleanup procedures and equipment use.

APPLICABILITY: ALL

SUPPORT SERVICES REQUIRED: None

ACCEPTABLE EQUIVALENCY As approved by ISIC

REQUIREMENTS: None

SCENARIO I: Ship is in port. Piping failure leads to complete venting of refrigerant from reefer deck into an AC machinery room. The body of one individual is visible from the access hatch/door.

SCENARIO II: Ship is underway. Misalignment of valve causes venting of refrigerant into AC machinery room. The body of one individual is visible from the access hatch/door.

PROCEDURES:

1. INITIAL PROCEDURES:
   a. Spill stopped and reported to DCC
   b. Ship reports spill via OPREP-3, Navy Blue or Unit SITREP, and Oil Spill Report, OPNAVINST. 5090.1
2. DAMAGE ASSESSMENT:
   a. Isolate area
   b. Breakout equipment to retrieve injured personnel
   c. Determine freon vapor concentration in the air
   d. Select protective equipment and clothing based on findings
3. REPAIR TASKS:
   a. Breakout spill cleanup equipment and stage materials in the local area
   b. Dress out personnel in appropriate protective equipment provided in the spill cleanup kit
   c. Remove injured personnel and provide first aid
   d. Contain liquid spill using Wing materials or other equipment
   e. Stage equipment and materials to maximize efficiency
   f. Separate contaminated materials for disposal
   g. Commence cleanup operations using absorbent pads and other equipment
   h. Collect contaminated materials for reuse or segregate for disposal
   i. Continue cleaning until no visible sign of liquid is present and vapor concentration level is below 10 percent of the LEL
   j. Containerize contaminated materials in preparation for transportation and disposal
   k. Restore unused materials
   1. Decontaminate personnel and equipment
   m. Package residual contaminated materials for disposal

Figure 1-5.—Spill drill for freon.

n. Stow equipment and unused materials in spill kit and return kit to storage

o. Make follow-up reports to NOSC via appropriate message formats in OPNAVINST 5090.1

SAFETY: Ensure the safety of all personnel and equipment.

MARKING FACTORS

1. Preparation. Evaluate adequacy of preparation including but not limited to the following:

	MAXIMUM CREDIT	SCORE
a. Spill cleanup kit available	5	
b. Spill contingency plan available	5	
c. Spill cleanup team briefing adequate	5	
2. Damage Control Organization:		
a. Spillage reported efficiently	5	
b. Immediate response adequate	20	
c. Message notification adequate	5	
d. Spill cleanup personnel level of knowledge in:		
(1) Use of equipment	10	
(2) Use of materials	10	
e. Speed and efficiency of the cleanup operation	20	
f. Safety of personnel throughout all aspects of the operation	15	

MAXIMUM SCORE 100
TOTAL SCORE ___

Figure 1-5.—Spill drill for freon—Continued.

- Recognition of the symptoms
- Probable causes
- Probable effects
- Preventive actions that may be taken to reduce, elimimte, or control casualties

An EOSS package is not intended to be forgotten once it is developed and installed. It offers many advantages to the ship's operational readiness capabilities and provides detailed, step-by-step sequencing of events for all phases of the engineering plant operation. Because it is work-studied and system-oriented, the EOSS provides the basic information for the optimum use of equipment and systems. It does this by specifying correct procedures tailored for a specific plant configuration.

The EOSS is not intended to eliminate the need for skilled plant operators. No program or system can achieve such a goal. The EOSS is a tool for better use of manpower and available skills. Although the EOSS is an excellent tool for shipboard training of personnel, it is primarily a working system for scheduling, controlling, and directing plant operations and casualty control procedures.

EOCC VERIFICATION CHECKS

Since EOCC procedures are a part of the EOSS, EOCC verification checks should be performed whenever the EOSS is verified. The purpose of verification checks is to validate required changes to EOCC procedures due to authorized SHIPALTs, changes in operating philosophy, or changes in parameters.

Cold Plant

During a ship's scheduled PMA/SRA/ROH, Naval Warfare Center Ships System Engineering Station (NAVWARCENSSES) Philadelphia will schedule an EOSS verification check (cold plant) approximately 4 weeks prior to the end of the ship's availability. This will ensure that all system modifications/installations affecting EOSS are completed before the check in order to permit an accurate update.

At the end of the verification check a copy of the affected EOSS documentation must be annotated and given to the ship for review and use when approved by the commanding officer. The annotated documents will be used until the final laminated EOSS is received (usually within 12 weeks).

Hot Plant

The hot plant checks are conducted just as the name describes. This means the plant is fully operational, and the checks are normally performed as a training evolution in the form of casualty control drills. These checks are usually used to fine tune watch-stander efficiency and identify procedural deficiencies.

USING THE FEEDBACK SYSTEM

Since the EOCC procedures makeup only part of the overall EOSS, we will discuss the use of the EOSS feedback system. The EOSS feedback system is the means by which you may make changes in your EOSS. Any naval activity may originate these requests. The information in this section will cover the proper preparation of feedback reports and other aspects of the feedback system.

You must submit feedbacks to accomplish the following:

1. Obtain replacement documents, holders, covers, and twisties.
2. Recommend approval of revisions for:
   a. Procedural changes to correct document errors.
   b. Configuration changes for authorized equipment or piping installations.

Feedback reports should NOT be submitted just because the EOSS conflicts with other technical guidance. The EOSS always supersedes other guidance! An EOSS feedback should be submitted only when the EOSS is suspected to be in error. Feedback on other documentation such as technical manuals should be submitted via its respective system.

Urgent Feedbacks

An urgent EOSS feedback report describes a technical discrepancy that could cause damage to equipment or injury to personnel. This category was established to provide rapid resolution of EOSS technical discrepancies related to genuine operational needs.

PREPARATION.— Submit urgent feedbacks by priority message to NAVWARCENSSES Philadelphia. Information addresses must include COMNAVSEA-SYSCOM Washington, DC, and your TYCOM. They must contain the following information:

1. An urgent EOSS feedback number consisting of the year and feedbacks sequential position based upon earlier urgent feedbacks you've submitted that year. For example, 93-2; the 93 represents the year and the 2 shows this as the second urgent feedback in 1993.
2. The code number of the EOSS procedure(s) involved (for example, BLF/O21/0585).
3. A detailed description of the problem.
4. The recommended solution citing appropriate justification and any reference documentation.

> **NOTE**
>
> Review each urgent feedback to be certain the feedbacks a valid urgent submission as defined in the EOSS user's guide.

PROCESSING.— An urgent feedback report is processed in the following manner:

1. The commanding officer authorizes a preliminary pen and ink change to the EOSS pending official guidance from the NAVWARCENSSES.
2. NAVWARCENSSES will provide guidance by message. This is done in 1 to 10 working days depending upon the complexity of the issue. TYCOM monitors and provides assistance as necessary.

3. The commanding officer authorizes the final pen and ink change to EOSS according to message guidance.

4. NAVWARCENSSES forwards advance copies of the corrected document(s) to the ship within 15 working days of the guidance message.

5. NAVWARCENSSES forwards final laminated documents to the ship within 3 months of the guidance message.

Routine Feedbacks

A routine EOSS feedback is one of two categories, A or B. Category A feedbacks are used to request EOSS materials. Category B feedbacks describe technical discrepancies that are not urgent. Recommended revisions could be an addition or deletion, or a change in the sequence of steps, the parameters, or the diagrams.

PREPARATION.— Submit routine feedbacks using the Planned Maintenance System (PMS) form, OPNAV 4790/7B. Each revision requested requires a separate form. If the same change is requested for several documents, it may be explained once and then listed on the documents affected. Rearranging several steps in a document because of a single technical change counts as one revision. On the other hand, more than one technical recommendation in a single document requires more than one form. The printed information on the PMS form does not apply to EOSS. Maintain a separate EOSS feedback system. When using this form for EOSS the following instructions apply:

1. Fill in the ship's name in the **FROM** block.

2. In the **SERIAL #** block, fill in a EOSS feedback number consisting of the year and the feedback's sequential position. Routine feedbacks must have a different set of feedback numbers than urgent feedbacks. Category A and B routine feedbacks should share the same set of numbers.

3. In the **DATE** block, fill in the date the feedback is to be mailed.

4. In the **TO** block, mark the appropriate square for category A or B feedbacks. For category A feedbacks write NAVWARCENSSES Philadelphia in the space provided.

5. Mark the **SUBJECT** block as follows:

   a. In the SYSTEM block, fill in either EOP or EOCC as appropriate.

   b. In the SYSCOM MIP block, fill in the document code number (for example, TG/0471/0980 and HBWL/0099/0980).

   c. Leave the APL and SYSCOM MRC blocks blank.

6. Leave the **DESCRIPTION OF PROBLEM** block blank except when you are commenting on a procedure that has not been finalized for your use. In that case mark the OTHER block with the words, HOT CHECKS. Situations when this would apply include a package that has been hot checked but not approved and installed, a package that belongs to another ship of the class, or before one ship's development,

7. Fill in the **REMARKS** section as follows:

   a. For category A feedbacks be specific.

      (1) Documents; specify code number(s) of document(s) needed and the number of laminated (max 2) and unlaminated copies requested.

      (2) Holders; specify type (single and/or double) and number of each requested.

      (3) Covers; specify type (EOP and/or EOCC) and number of each requested.

      (4) Twisties; specify size (4-3/4", 5-3/4", or 8") and number-of each requested.

   b. For category B feedbacks, be as clear as possible. The more precise you are, the faster a response can be generated

      (1) Identify the location of the problem in the EOSS document.

      (2) Describe the problem and recommend a solution.

      (3) Reference your justification for the change where applicable. Provide a copy of the reference pages that support your recommendation

      (4) Use the unlaminated logroom copy, make a photocopy of the procedure, and mark it to reflect your recommendation Attach a duplicate of the unlaminated copy to the 4790/7B form. Do not use a yellow marker because it will not photocopy. Do not obscure the original

text or the reference, because this will cause a delay in answering your request.

8. In the signature blocks, indicate with an asterisk* the person who would serve as the best point of contact. Make sure the name is legible and include phone numbers when possible. The **3-M COORDINATOR** block must be signed by the EOSS coordinator. Note that the EOSS feedback system is separate from the PMS system. The distribution of the feedback copies is as follows:

   a. White, yellow, and pink copies to NAVWARCENSSES Philadelphia for category A feedbacks or to the TYCOM for category B feedbacks. If the TYCOM determines that the NAVWARCENSSES action is appropriate, they will forward the white and yellow copies to NAVWARCENSSES. The white copy will be returned with the requested material for category A feedbacks. No copies will be returned for category B feedbacks.

   b. The blue copy is retained by the EOSS coordinate.

   c. The green copy is retained by the originating work center.

PROCESSING.— Feedbacks are processed as quickly as possible. Generally, the more comprehensively prepared a feedback is, the easier it is to answer. Do all the homework you can before submitting a feedback.

1. Category A feedbacks are sent to NAVWARCENSSES. The items requested are forwarded within 21 working days of the request receipt.

2. Category B feedbacks are screened by the TYCOM and may be answered by them and returned to you. This could occur when your recommended change is not according to their policy or EOSS program policy. When your TYCOM forwards the feedback to NAVWARCENSSES, there are three possible responses.

   a. Concur—Advance copies of the revised document(s) will be forwarded.

   b. Do not concur—An explanation of the reason for nonconcurrence will be forwarded within 21 working days of receipt.

   c. Other—Advance and final copies will be forwarded as with concur items. An explanation of the partial concurrence will accompany the advance copies.

3. Annotations for routine feedbacks are limited to documenting authorized configuration changes. Routine procedural/parameter pen and ink changes are not authorized.

Make Local Changes to Manuals

Local changes to EOSS are **NOT AUTHORIZED** except as described in section 4 of chapter 1 of the EOSS User's Guide. Only NAVWARCENSSES can approve and issue changes to the NAVSEA-installed EOSS.

PREPARE FULL POWER AND ECONOMY TRIAL REPORTS

As a GS supervisor, full power and economy trials will be a very important part of your responsibilities. Through proper leadership and training these trials can be proof of your management skills. They are proof of your ability to maintain your propulsion equipment at peak levels of performance.

Although FXP-4 mobility (MOB) exercises delineate general requirements for conducting engineering trials, inconsistencies have developed among different naval commands in levying different requirements for full power and economy trials for nonnuclear surface ships. Full power and economy trial requirements are based partially on calculations and partially on design requirements. It is not economically feasible to conduct full-scale trials to document every possible condition. Therefore, to avoid confusion, the reporting system for trial results is found in OPNAVINST 9094.1, *Full Power and Economy Trial Requirements for Non-nuclear Surface Ship Classes.*

In this section we will briefly discuss the performance of these trials and the processing of data needed to complete the required reports.

FULL POWER TRIALS

A full power trial must be conducted annually for a minimum duration of one hour and at a minimum depth of water as prescribed in NSTM, chapter 094. All full

power trials shall be conducted with a minimum 75 percent liquid load at the commencement of the trial. During the trials, fleet and type commanders must ensure machinery alignments are according to heat balance diagrams, propulsion operating guides, and applicable technical documentation.

Compile Information

The information compiled during the full power trial must be entered on standard forms used for all gas turbine-powered ships. All the following forms except the one shown in figure 1-9 are available through normal supply channels according to NAVSUP P-2002. Figure 1-6 is the trial transmittal letter (cover sheet), OPNAV form 9094/1A, NSN 0107-LF-090-9405. Figure 1-7 is sheet 1 of 2 of the trial data form, OPNAV form 9094/1D, NSN 0107-LF-090-9440. Figure 1-8 is sheet 2 of 2 of the trial data form, OPNAV form 9094/1D, NSN 0107-LF-090-9445. View A shows plant condition data for 1A GTE, while view B shows data for 1B GTE. The form shown in figure 1-9 is not available in the supply system, but it is the standard format used to report the actual propulsion plant condition to the chief observer before a full power or even an economy trial commences.

Disseminate Information

For you to properly disseminate the information, you must be familiar with all operating characteristics of your plant. In other words, you need to go back to the basics and use all the guidelines provided in the EOSS and applicable technical manuals. If the readings are improperly disseminated, it could mean the difference between a satisfactory or unsatisfactory trial.

ECONOMY TRIALS

Economy trials in most cases will be scheduled on the same day as the full power trials. They are usually scheduled in this manner because of the ship's competitive exercise schedule and the availability of observers. Just because these trials are usually conducted together does not mean their accomplishment periodicity is the same. Economy trial periodicity is established by your fleet and type commanders. Fleet and type commanders also must be sure machinery alignments during economy trials conform to propulsion operating guides and NAVSEA, SL101-AA-GYD-010, Energy Conservation.

All the economy trial report forms are the same as those used for the full power trials. Refer again to figures 1-6 through 1-8. The forms are the same, but the information entered in the equipment operating sections of these forms may differ. However, if both trials are accomplished on the same day, the information provided on the form shown in figure 1-9 will be the same.

DRAFT REPORTS

Reports of all satisfactory and unsatisfactory engineering trials must be provided to Commander, Naval Sea Systems Command (SEA56X1). The report of an unsatisfactory trial is particularly important. It provides information on design or material problems that preclude a successful trial.

MARINE GAS TURBINE EQUIPMENT LOGBOOKS

The Navy deploys gas turbine equipment in propulsion and ship-services systems in its surface fleet. Selection of gas turbine equipment for these systems reflects a commitment to increase ship availability through reduction in system downtime. Gas turbine equipment combines acceptable reliability and onboard maintenance features with ease of removal and replacement. System downtime and lower shipboard manning levels have been realized through properly directed maintenance and logistic support, and reliability and maintainability improvement efforts.

Service records, as described in this section, are used to retain significant historical operating and maintenance data of gas turbine equipment transferred between shipboard installations and repair or rework facilities. Service records provide a consolidated source of background information available to personnel conducting and analyzing maintenance activity.

All gas turbine records are designed according to the 3-M Maintenance Data System (MDS) organizational (ship) maintenance data collection or reporting requirements. They are particularly important because of the interface in marine gas turbine equipment support between shipboard organizational maintenance and shore-based depot maintenance.

The use of service records and logbooks is similar to the approach applied successfully in NAVAIR for many years in the aircraft jet engine community.

05 MARCH 1993

From: Chief Observer. GSCM (SW) J. Frost. USN. 111-11-1111
To: Commander, Destroyer Squadron Zero Zero
Via: 1. CO, USS Turbine (FFG-99)
2.
3.

Subj: USS Turbine (FFG-99) Trial Report: Forwarding of

Encl: (1) DATA SHEET
(2) CO, USS Turbine (FFG-99) Letter to Chief Observer

1. A(n) Full Power Trial (MOB-E-001-SF) Trial is reported herewith.

2. The ship complied with current directives as follows:

Split plant was utilized (if applicable) NA ☐ YES ☐ NO

Prescribed material condition was maintained ☒ YES ☐ NO

NOTE: Material condition Zebra set on fire and drainage systems.

Usual services were maintained during the trial, as follows:

☐ BOILER ☒ EVAPORATORS ☒ LIGHTING ☒ OTHER *(Specify)* Hotel Services, Port Stbd Fin Stablizers

Liquid loading equaled 79.2 %

Submarines Only: Status of fuel ballast tanks: Tank numbers (full) NA : Tank numbers (empty) NA

Limiting speeds, temperatures, pressures(xxx/were not) exceeded.

3. Violations of safety precautions or of good engineering practices were noted, as follows:

None Noted

4. Information concerning fuel and power is as follows:

FUEL		POWER	INBOARD SHAFTS	OUTBOARD SHAFTS
USED	2377	REQUIRED ENGINE SPEED, PROPELLER RPM AND/OR PITCH TOTAL KW PROPULSION GENERATIONS OR BATTERY RATE (REQUIRED).	178 RPM 23.5 FT	NA
ALLOWED	2560	ENGINE SPEED, PROPELLER RPM, AND/OR PITCH TOTAL KW PROPULSION GENERATORS OR BATTERY RATE (MADE)	179.8 RPM 23.5 FT	NA
PERFORMANCE RATIO	1.00			

5. Trial requirements (were/XXXX) met (if not met, specify reason)

6. A mark of 100 % is recommended for this exercise.

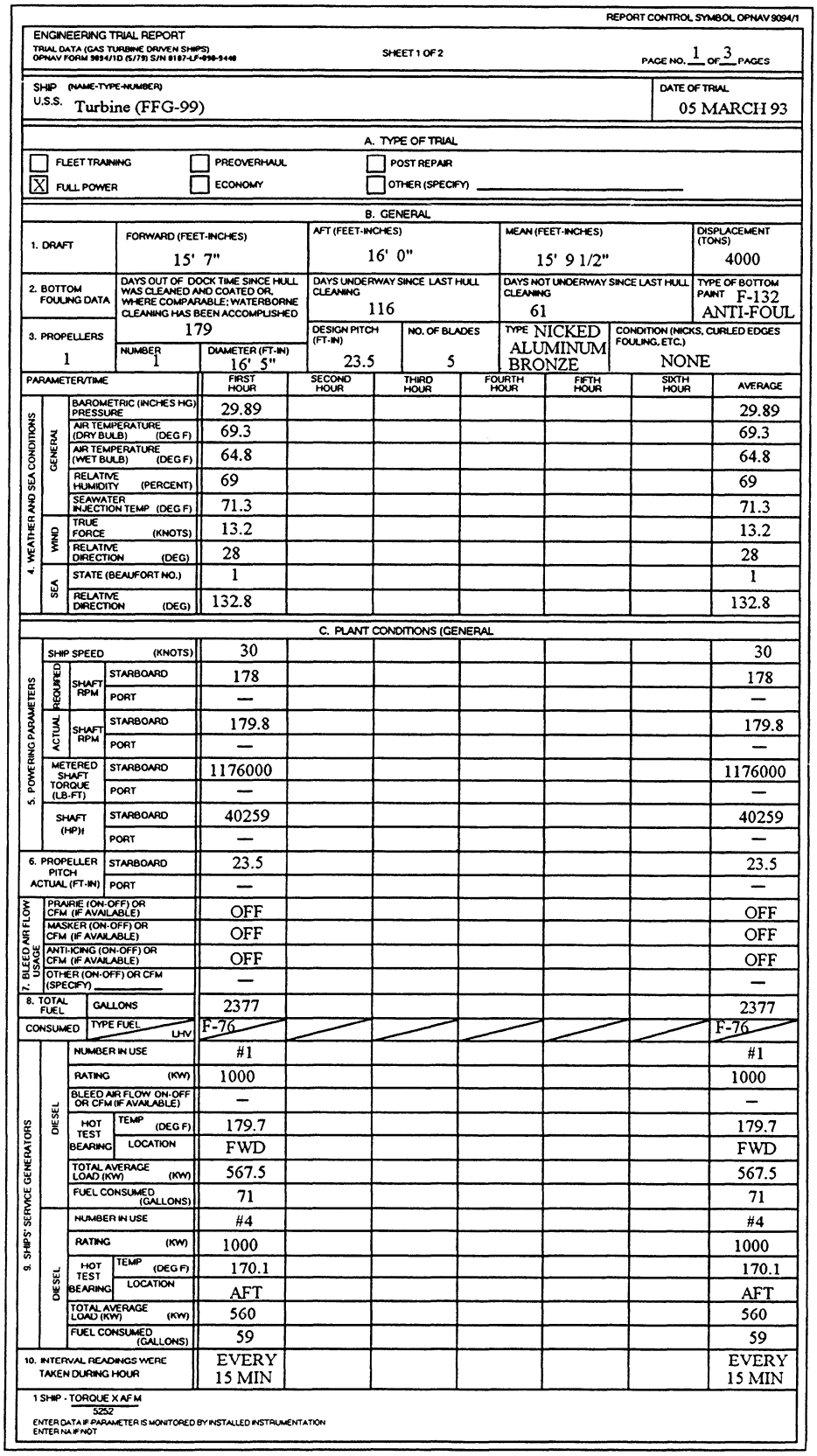
COPY TO:
COMSAVSEASYSCOM (Sea 56X1) *(Complete)*
Washington DC
SWOSCOLCOM Newport RI *(Complete)*

(Signature)

ENGINEERING TRIAL REPORT
TRANSMITTAL LETTER
OPNAV 9094/1A(5-79) S/N 0107-LF-090-9405

REPORT CONTROL SYMBOL 9094.1

Figure 1-6.—Engineering trial report transmittal letter.



REPORT CONTROL SYMBOL OPNAV 9094/1

ENGINEERING TRIAL REPORT
TRIAL DATA (GAS TURBINE DRIVEN SHIPS)
OPNAV FORM 9094/1D (5/79) S/N 0107-LF-090-5440

SHEET 1 OF 2

PAGE NO. 1 OF 3 PAGES

SHIP (NAME-TYPE-NUMBER): U.S.S. Turbine (FFG-99)

DATE OF TRIAL: 05 MARCH 93

A. TYPE OF TRIAL

- [ ] FLEET TRAINING
- [ ] PREOVERHAUL
- [ ] POST REPAIR
- [X] FULL POWER
- [ ] ECONOMY
- [ ] OTHER (SPECIFY) _____

B. GENERAL

1. DRAFT	FORWARD (FEET-INCHES): 15' 7"	AFT (FEET-INCHES): 16' 0"	MEAN (FEET-INCHES): 15' 9 1/2"	DISPLACEMENT (TONS): 4000
2. BOTTOM FOULING DATA	DAYS OUT OF DOCK TIME SINCE HULL WAS CLEANED AND COATED OR, WHERE COMPARABLE; WATERBORNE CLEANING HAS BEEN ACCOMPLISHED: 179	DAYS UNDERWAY SINCE LAST HULL CLEANING: 116	DAYS NOT UNDERWAY SINCE LAST HULL CLEANING: 61	TYPE OF BOTTOM PAINT: F-132 ANTI-FOUL
3. PROPELLERS: 1	NUMBER: 1 / DIAMETER (FT-IN): 16' 5"	DESIGN PITCH (FT-IN): 23.5 / NO. OF BLADES: 5	TYPE: NICKED ALUMINUM BRONZE	CONDITION (NICKS, CURLED EDGES FOULING, ETC.): NONE

PARAMETER/TIME			FIRST HOUR	SECOND HOUR	THIRD HOUR	FOURTH HOUR	FIFTH HOUR	SIXTH HOUR	AVERAGE
4. WEATHER AND SEA CONDITIONS	GENERAL	BAROMETRIC (INCHES HG) PRESSURE	29.89						29.89
		AIR TEMPERATURE (DRY BULB) (DEG F)	69.3						69.3
		AIR TEMPERATURE (WET BULB) (DEG F)	64.8						64.8
		RELATIVE HUMIDITY (PERCENT)	69						69
		SEAWATER INJECTION TEMP (DEG F)	71.3						71.3
	WIND	TRUE FORCE (KNOTS)	13.2						13.2
		RELATIVE DIRECTION (DEG)	28						28
	SEA	STATE (BEAUFORT NO.)	1						1
		RELATIVE DIRECTION (DEG)	132.8						132.8
C. PLANT CONDITIONS (GENERAL									
5. POWERING PARAMETERS		SHIP SPEED (KNOTS)	30						30
	REQUIRED	SHAFT RPM STARBOARD	178						178
		SHAFT RPM PORT	—						—
	ACTUAL	SHAFT RPM STARBOARD	179.8						179.8
		SHAFT RPM PORT	—						—
		METERED SHAFT TORQUE (LB-FT) STARBOARD	1176000						1176000
		METERED SHAFT TORQUE (LB-FT) PORT	—						—
		SHAFT (HP)1 STARBOARD	40259						40259
		SHAFT (HP)1 PORT	—						—
6. PROPELLER PITCH ACTUAL (FT-IN)		STARBOARD	23.5						23.5
		PORT	—						—
7. BLEED AIR FLOW USAGE		PRAIRIE (ON-OFF) OR CFM (IF AVAILABLE)	OFF						OFF
		MASKER (ON-OFF) OR CFM (IF AVAILABLE)	OFF						OFF
		ANTI-ICING (ON-OFF) OR CFM (IF AVAILABLE)	OFF						OFF
		OTHER (ON-OFF) OR CFM (SPECIFY) _____	—						—
8. TOTAL FUEL CONSUMED		GALLONS	2377						2377
		TYPE FUEL LHV	F-76						F-76
9. SHIP'S SERVICE GENERATORS	DIESEL	NUMBER IN USE	#1						#1
		RATING (KW)	1000						1000
		BLEED AIR FLOW ON-OFF OR CFM (IF AVAILABLE)	—						—
		HOT TEST BEARING TEMP (DEG F)	179.7						179.7
		HOT TEST BEARING LOCATION	FWD						FWD
		TOTAL AVERAGE LOAD (KW) (KW)	567.5						567.5
		FUEL CONSUMED (GALLONS)	71						71
	DIESEL	NUMBER IN USE	#4						#4
		RATING (KW)	1000						1000
		HOT TEST BEARING TEMP (DEG F)	170.1						170.1
		HOT TEST BEARING LOCATION	AFT						AFT
		TOTAL AVERAGE LOAD (KW) (KW)	560						560
		FUEL CONSUMED (GALLONS)	59						59
10. INTERVAL READINGS WERE TAKEN DURING HOUR			EVERY 15 MIN						EVERY 15 MIN

1 SHIP · TORQUE X RPM / 5252

ENTER DATA IF PARAMETER IS MONITORED BY INSTALLED INSTRUMENTATION
ENTER NA IF NOT

Figure 1-7.—Engineering trial report data, sheet 1 of 2.

REPORT CONTROL SYMBOL OPNAV 9094/1

ENGINEERING TRIAL REPORT
TRIAL DATA (GAS TURBINE DRIVEN SHIPS)
OPNAV FORM 9094/1D (5/79) S/N 0107-LF-090-5448

PAGE NO. 2 OF 3 PAGES

SHIP (NAME-TYPE-NUMBER): U.S.S. Turbine (FFG-99)

DATE OF TRIAL: 05 MARCH 93

ENGINE ROOM NUMBER: MAIN ENGINE ROOM

MAIN ENGINE OR MAIN PROPULSION UNIT NUMBER: 1A GTE

D. PLANT CONDITIONING (DETAILED)

	PARAMETER/TIME	FIRST HOUR	SECOND HOUR	THIRD HOUR	FOURTH HOUR	FIFTH HOUR	SIXTH HOUR	AVERAGE
1. GAS GENERATOR	SPEED (RPM)	8800						8800
	COMPRESSOR INLET TEMPERATURE (DEG F)	69.3						69.3
	COMPRESSOR INLET TOTAL PRESSURE (PSIA)	14.3						14.3
	COMPRESSOR DISCHARGE PRESSURE (PSIG)	193.3						193.3
	VIBRATION LEVEL MEASURED BY GAS GENERATOR PICKUP (MILS)	2.0						2.0
	VIBRATION LEVEL MEASURED BY POWER TURBINE PICKUP (MILS)	0.5						0.5
	BLEED AIR FLOW ON-OFF OR CFM (IF AVAILABLE)	OFF						OFF
2. POWER TURBINE	SPEED (RPM)	3550						3550
	TORQUE (LB-FT)	30250						30250
	POWER (HP)	20175						20175
	TURBINE INLET TEMPERATURE (DEG F)	1377.1						1377.1
	TURBINE INLET PRESSURE (PSIA)	49.1						49.1
	VIBRATION LEVEL MEASURED BY POWER TURBINE PICKUP (MILS)	1.0						1.0
	VIBRATION LEVEL MEASURED BY GAS GENERATOR PICKUP (MILS)	0.8						0.8
	EXHAUST GAS TEMPERATURE* (DEG F)	875						875
	EXHAUST GAS PRESSURE* ($IN H_2O$) (PSIG)	—						—
3. GT FUEL OIL	MANIFOLD PRESSURE (PSIG)	632.3						632.3
	INLET TEMPERATURE (DEG F)	94.4						94.4
4. LUBE OIL	GT SUPPLY PRESSURE (PSIG)	51.5						51.5
	COOLER OUTLET TEMPERATURE (DEG F)	168.6						168.6
	HOTTEST BEARING LOCATION	B						B
	HOTTEST BEARING TEMPERATURE (DEG F)	198.3						198.3
5. ENGINE COOLING OUTLET TEMPERATURE (DEG F)		207.4						207.4
6. FUEL CONSUMED* (GALLONS)		2247						2247
7. INTERVAL READINGS WERE TAKEN DURING HOUR		EVERY 15 MIN						EVERY 15 MIN

* ENTER DATA IF PARAMETER IS MONITORED BY INSTALLED INSTRUMENTATION ENTER NA IF NOT

* NOTE: FUEL CONSUMED FOR BLOCK 6 IS TOTAL FOR BOTH GTE'S USE CONSUMED

VIEW A

REPORT CONTROL SYMBOL OPNAV 9094/1

ENGINEERING TRIAL REPORT
TRIAL DATA (GAS TURBINE DRIVEN SHIPS)
OPNAV FORM 9094/1D (5/79) S/N 0107-LF-090-5448

PAGE NO. 3 OF 3 PAGES

SHIP (NAME-TYPE-NUMBER): U.S.S. Turbine (FFG-99)

DATE OF TRIAL: 05 MARCH 93

ENGINE ROOM NUMBER: MAIN ENGINE ROOM

MAIN ENGINE OR MAIN PROPULSION UNIT NUMBER: 1B GTE

D. PLANT CONDITIONING (DETAILED)

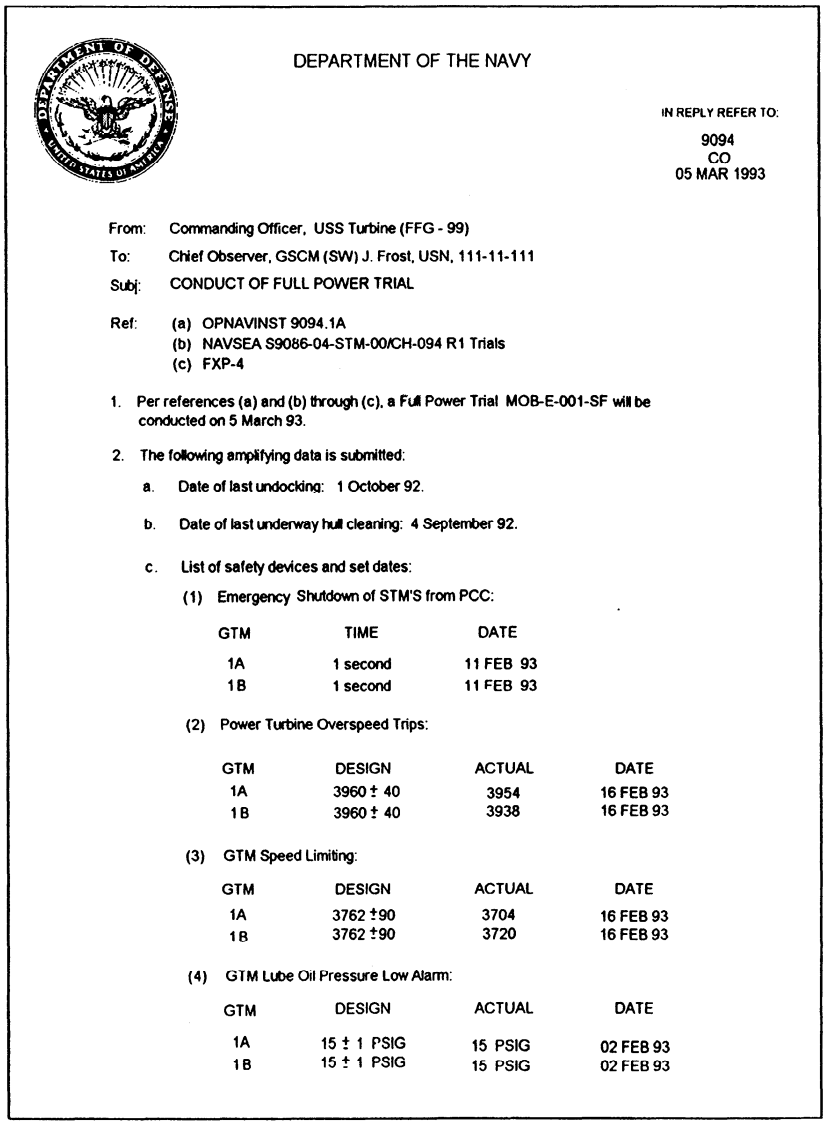
	PARAMETER/TIME	FIRST HOUR	SECOND HOUR	THIRD HOUR	FOURTH HOUR	FIFTH HOUR	SIXTH HOUR	AVERAGE
1. GAS GENERATOR	SPEED (RPM)	8700						8700
	COMPRESSOR INLET TEMPERATURE (DEG F)	66.0						66.0
	COMPRESSOR INLET TOTAL PRESSURE (PSIA)	14.3						14.3
	COMPRESSOR DISCHARGE PRESSURE (PSIG)	194.6						194.6
	VIBRATION LEVEL MEASURED BY GAS GENERATOR PICKUP (MILS)	0.5						0.5
	VIBRATION LEVEL MEASURED BY POWER TURBINE PICKUP (MILS)	1.0						1.0
	BLEED AIR FLOW ON-OFF OR CFM (IF AVAILABLE)	OFF						OFF
2. POWER TURBINE	SPEED (RPM)	3500						3500
	TORQUE (LB-FT)	30625						30625
	POWER (HP)	20325						20325
	TURBINE INLET TEMPERATURE (DEG F)	1397.5						1397.5
	TURBINE INLET PRESSURE (PSIA)	50.3						50.3
	VIBRATION LEVEL MEASURED BY POWER TURBINE PICKUP (MILS)	0.6						0.6
	VIBRATION LEVEL MEASURED BY GAS GENERATOR PICKUP (MILS)	0.5						0.5
	EXHAUST GAS TEMPERATURE* (DEG F)	878						878
	EXHAUST GAS PRESSURE* ($IN H_2O$) (PSIG)	—						—
3. GT FUEL OIL	MANIFOLD PRESSURE (PSIG)	650.3						650.3
	INLET TEMPERATURE (DEG F)	93.9						93.9
4. LUBE OIL	GT SUPPLY PRESSURE (PSIG)	53.1						53.1
	COOLER OUTLET TEMPERATURE (DEG F)	176.5						176.5
	HOTTEST BEARING LOCATION	B						B
	HOTTEST BEARING TEMPERATURE (DEG F)	198.3						198.3
5. ENGINE COOLING OUTLET TEMPERATURE (DEG F)		191.5						191.5
6. FUEL CONSUMED* (GALLONS)		2247						2247
7. INTERVAL READINGS WERE TAKEN DURING HOUR		EVERY 15 MIN						EVERY 15 MIN

* ENTER DATA IF PARAMETER IS MONITORED BY INSTALLED INSTRUMENTATION ENTER NA IF NOT

* NOTE: FUEL CONSUMED FOR BLOCK 6 IS TOTAL FOR BOTH GTE'S USE CONSUMED

VIEW B

Figure 1-8.—Engineering trial report data, sheet 2 of 2.



DEPARTMENT OF THE NAVY

IN REPLY REFER TO:
9094
CO
05 MAR 1993

From: Commanding Officer, USS Turbine (FFG - 99)

To: Chief Observer, GSCM (SW) J. Frost, USN, 111-11-111

Subj: CONDUCT OF FULL POWER TRIAL

Ref: (a) OPNAVINST 9094.1A
(b) NAVSEA S9086-04-STM-00/CH-094 R1 Trials
(c) FXP-4

1. Per references (a) and (b) through (c), a Full Power Trial MOB-E-001-SF will be conducted on 5 March 93.

2. The following amplifying data is submitted:

a. Date of last undocking: 1 October 92.

b. Date of last underway hull cleaning: 4 September 92.

c. List of safety devices and set dates:

(1) Emergency Shutdown of STM'S from PCC:

GTM	TIME	DATE
1A	1 second	11 FEB 93
1B	1 second	11 FEB 93

(2) Power Turbine Overspeed Trips:

GTM	DESIGN	ACTUAL	DATE
1A	3960 ± 40	3954	16 FEB 93
1B	3960 ± 40	3938	16 FEB 93

(3) GTM Speed Limiting:

GTM	DESIGN	ACTUAL	DATE
1A	3762 ±90	3704	16 FEB 93
1B	3762 ±90	3720	16 FEB 93

(4) GTM Lube Oil Pressure Low Alarm:

GTM	DESIGN	ACTUAL	DATE
1A	15 ± 1 PSIG	15 PSIG	02 FEB 93
1B	15 ± 1 PSIG	15 PSIG	02 FEB 93

VIEW A

Subj: CONDUCT OF FULL POWER TRIAL

(5) MRG Lube Oil Pressure Low Alarm:

DESIGN	ACTUAL	DATE
9 ± 1 PSIG	9 PSIG	24 FEB 93

(6) SSDG Overspeed Trip:

SSDG	DESIGN	ACTUAL	DATE
1	2070 ± 30 RPM	2060	09 SEP 92
2	2070 ± 30 RPM	2060	09 SEP 92
3	2070 ± 30 RPM	2075	09 SEP 92
4	2070 ± 30 RPM	2075	09 SEP 92

(7) SSDG Oil Pressure Alarm:

SSDG	DESIGN	ACTUAL	DATE
1	48 ± 1 PSIG	48 PSIG	18 JAN 93
2	48 ± 1 PSIG	48 PSIG	18 JAN 93
3	48 ± 1 PSIG	48 PSIG	21 JAN 93
4	48 ± 1 PSIG	48 PSIG	21 JAN 93

(8) SSDG Lube Oil Pressure Low Shutdown:

SSDG	DESIGN	ACTUAL	DATE
1	42 ± 1 PSIG	42 PSIG	18 JAN 93
2	42 ± 1 PSIG	43 PSIG	18 JAN 93
3	42 ± 1 PSIG	42 PSIG	21 JAN 93
4	42 ± 1 PSIG	43 PSIG	21 JAN 93

(9) Remote Shutdown Valves:

VALVE	SERVICE	DATE
PFS 10A	Fuel Supply Cutout 1A GTM	15 JAN 93
PFS 10B	Fuel Supply Cutout 1A GTM	15 JAN 93
PFS 1A	Fuel Service Tank 5-204-1F	15 JAN 93
PFS 1B	Fuel Service Tank 5-204-2F	15 JAN 93

d. All machinery safety devices were tested satisfactorily as per current PMS requirements cycle.

e. Following unsafe or unsatisfactory conditions exist in the propulsion and auxiliary plant: NONE

f. Following equipment is listed as 00C: 1 A/C.

W. T. DOOR

VIEW B

Figure 1-9.—Propulsion plant condition report

The Navy's policy is, all activities having custody of marine gas turbine equipment, that is, single-shaft engine assemblies or modular engine assemblies (major sections of the engine that are replaceable), associated components, accessories, and ancillary equipment, must maintain service records in a proper and up-to-date status.

REVIEW MGTE LOG BOOKS (MGTEL)

A periodic review of the MGTEL should be done and as a GS supervisor you may be tasked with this job. In the *Gas Turbine Systems Technician (Mechanical) 2* and *Gas Turbine Systems Technician (Electrical) 2* training manuals you were told the MGTEL is a hardcover book that houses all the marine gas turbine equipment service records (MGTESRs). You were also given a basic description of each record sheet and the type of information found on each sheet that makes up the various sections of the MGTEL.

In addition to the information provided in the rate training manuals and *NSTM,* chapter 234, you can use this sample checklist to follow when you conduct a review of your logbooks. The numbers listed at the end of each statement or question are reference paragraphs from *NSTM,* chapter 234.

1. Are receipts of engines signed for? 234-8.40
2. Are operating times logged monthly (minimum)? 234-8.44
3. Are operating times up to date? 234-8.44
4. Is there a special inspection page? 234-8.51
5. Is there a conditional inspection page? 234-8.51
6. Are required inspections entered (as per bulletins, casualties, pre-delivery, and such)? 234-8.50/51
7. Is there a gas turbine change (GTC) page? 234-8.55
8. Is there a GTC revision/amendment page? 234-8.60
9. Is there a gas turbine bulletin (GTB) page? 234-8.55
10. Is there a GTB revision/amendment page? 234-8.62
11. Are GTCs in numerical sequence? 234-8.62
12. Are GTBs in numerical sequence? 234-8.62
13. Do GTCs contain action categories? 234-8.57
14. Do GTCs contain status codes? 234-8.62
15. Do GTCs contain a brief description? 234-8.62
16. Do GTBs contain action categories? 234-8.57
17. Do GTBs contain status codes? 234-8.62
18. Do GTBs contain brief descriptions? 234-8.62
19. Is there a complete list of technical directives issued? IAW latest zero index.
20. Does the revisions issued column reflect the revisions/amendments issued? 234-8.60
21. Are NINC or NIS entries in pencil? 234-8.62.3.b
22. Are INC entries in ink or typed? 234-8.30
23. Does the selected component record (SCR) card/supplemental record indicate INC or NINC for directives issued? 234-8.61
24. Does the SCR page reflect current inventory? 234-8.66
25. Is the removal/replacement data correct on the SCR cards? 234-8.66
26. Is the total equipment count consistent with operating log entries? 234-8.67
27. Are "hours" or "start" entries followed by "H" or "S"? Fig. 234-8.28K
28. Is there a JCN on the SCR card for replaced components? 234-8.75
29. Is pertinent information for which no other place has been provided recorded on the miscellaneous history page? 234-8.64

UPDATE MGTE SERVICE AND OPERATING RECORDS

Updating MGTE service and operating records is normally performed by the log custodian. The log custodian is usually the main propulsion assistant (MPA). Even though the MPA is the log custodian, you may still be tasked to make updates to the logs. In any case, if you follow the guide provided in the next section you will know what entries are required and the proper way to make the update.

WHB OPERATING AND TREATMENT RECORDS

Even though the WHBs installed on your ship are considered auxiliary equipment, they play a very important role in the ship's ability to remain

self-sufficient. That's why close scrutiny of their operating and treatment records is so important. The importance of maintaining accurate WHB operating records, boiler water and feedwater chemistry logs and records must not be underestimated. The engineer officer and assistants use the data in these records to measure the performance, stability, efficiency, and state of material readiness of the engineering plant. Remember, the decision-making process involved in effective WHB operations and the water chemistry program aboard your ship is supported by the information contained in these records. To be an effective engineer and supervisor, you should be familiar with the purpose, content, and general procedures to properly review and train your personnel to maintain each of these records.

UPDATE WHB OPERATING RECORDS

WHB operating records information is derived and compiled from several different logs and inspection reports. Basic boiler information is recorded in the engineering log as events occur. These events normally include start-ups, shutdowns, and blowdowns. However, the primary log where the majority of information is compiled is the WHB Boiler Water Chemistry Worksheet/Log. This log is updated as events occur and is closed out on a daily basis. Basically, all maintenance performed on the boiler and its operating systems, chemical treatments, and operating hours are entered in either the Remarks section or the Boiler Data section on the backside of the WHB Boiler Water Chemistry Worksheet/Log.

The last source of boiler status information that we will discuss is the Boiler Inspection and Repair Management Information System (BIRMIS) report. This system's purpose is to enhance the value of auxiliary boiler inspections. The BIRMIS report contains useful information concerning the health of your WHB. This report is filled out by the boiler inspector at the completion of any standard or emergent boiler inspection. As a supervisor you must understand the information provided in this report so you can effectively plan (schedule) and correct the listed discrepancies. In figure 1-10 of this next section, there is a sample of a BIRMIS report. This sample report should help you identify and understand the information provided.

As you can see, the BIRMIS report is broken down into three distinct sections. This sample report is representative of the inspection of the No. 3 WHB. The first section is the cover sheet and some standard information that you provide to the inspector. The second section is for inspector comments. In this sample, the inspector chose to provide a list of references that would be used as guidelines to perform the inspection. The third section contains (from left to right) the item (component) inspected, the number of discrepancies noted (entry condition), the recommended repair, and the deficiency status code. For clarification and standardization, the BIRMIS system uses set codes to identify each boiler component and subcomponents being inspected. As in the sample form, the **C** represents the boiler tubes (primary), and the **Cl** and **Cll** represent specific sections of the tubes. And finally, the entry condition is the sequential listing of each discrepancy found for that component.

UPDATE WHB WATER TREATMENT RECORDS

As a GS supervisor you must become more familiar with updating and reviewing WHB water treatment records. Depending on your assignment within the engineering department and if your ship has boilers, you will be tasked either daily or intermittently with updating and reviewing these records. In the remainder of this section you will find two basic check sheets (figs. 1-11 and 1-12) that you can use to properly review the WHB water treatment records. These check sheets are not mandatory, but the information is very helpful. This information was taken directly from an *NSTM* and the numbers listed at the end of each question should be a help to you.

SUMMARY

In this chapter we have discussed various programs, reports, and records needed by GS supervisors. The titles of the different sections of this chapter may sound like many of those presented in some engineering administration publications. Even though the topics are in other publications, the information in this chapter is specific togas turbine-powered ships. Throughout this chapter you have been referred to the EOSS, applicable technical manuals, or the PMS for specific information. You must use these references to guide you through the procedures. Use of the EOSS, technical manuals, and the PMS will help you make the proper decisions to best handle the duties of a GS supervisor.

STANDARD FORMAT, ALL RESULTS BOILER INSPECTION AND REPAIR RUN DATE 12 MAR 93

STARTING ITEM: C ENDING ITEM: W9 MANAGEMENT INFORMATION SYSTEM PAGE 1

BOILER INSPECTION REPORT

HULL	SHIP	BOILER	DATE	TYPE	MFG	INSPECTOR(S)	INSPECTOR UIC
DD-999	USS G. TURBINE	AUX3	24-NOV-92	ROUTINE	C2	DOE, JOHN BTC	00001
						FROST, JACK BTC	00002

OVERHAUL ACTIVITY: SSSD

STEAMING HOURS

TOTAL HOURS ON BOILER: 13667.7

HOURS SINCE LAST OVERHAUL: 2420.4

HOURS SINCE FIRESIDE/GASSIDE CLEANING: 0

HOURS SINCE WATERSIDE CLEANING
CHEMICAL CLEANING (ACID): 0
MECHANICAL CLEANING:

HOURS OF DRY FIRING: 38.5

DATE INFORMATION

DATE OF LAST AVAILABILITY:	FEB 91
DATE OF LAST OVERHAUL:	FEB 91
DATE OF LAST TUBE NDE (BUIU, UT, ETC.):	UNK
DATE OF LAST 150% HYDROSTATIC STRENGTH TEST:	01OCT92
DATE OF LAST 5-YR VISUAL INSPECTION:	UNK
DATE OF LAST SOOT BLOWER NDE:	UNK
DATE OF LAST BOTTOM/SURFACE: BLOW PIPING NDE:	UNK

DEFICIENCY STATUS CODES

NC - NOT COMPLETE

C - COMPLETE

D - DEFERRED

W - WAIVERED

PI - PREVIOUSLY INSPECTED (NOT COMPLETED)

NA - NOT APPLICABLE

Figure 1-10.—Sample BIRMIS report.

STANDARD FORMAT, ALL RESULTS BOILER INSPECTION AND REPAIR RUN DATE 12 MAR 93

STARTING ITEM: C ENDING ITEM: W9 MANAGEMENT INFORMATION SYSTEM PAGE 2

BOILER INSPECTION REPORT

HULL	SHIP	BOILER	DATE	TYPE	MFG	INSPECTOR(S)	INSPECTOR UIC
DD-999	USS G. TURBINE	AUX3	24-NOV-92	ROUTINE	C2	DOE, JOHN BTC	00001
						FROST, JACK BTC	00002

INSPECTOR'S COMMENTS

REFERENCES:

A. Boiler Inspection Manual, S9221-D2-MMA-010, formerly NAVSEA O951-LP-021-6010

B. Boiler Overhaul and Repair Manual, 9221-C1-GTP-010/020, formerly NAVSEA 0951-LP-031-8010

C. "Boiler Water/Feedwater Test and Treatment," *NSTM* S9086-GX-STM-020, chapter 220

D. "Boilers," *NSTM*, S9086-GY-STM-010, chapter 221

E. Boiler Technician Manual, NAVSEA 0951-LP-031-0010

Figure 1-10.—Sample BIRMIS report—Continued.

BOILER INSPECTION AND REPAIR RUN DATE 12 MAR 93

MANAGEMENT INFORMATION SYSTEM PAGE 3

BOILER INSPECTION REPORT

HULL	SHIP	BOILER	DATE	TYPE	MFG	INSPECTOR(S)	INSPECTOR UIC
DD-999	USS G. TURBINE	AUX3	24-NOV-92	ROUTINE	CS	DOE, JOHN BTC	00001
						FROST, JACK BTC	00002

LINE ITEM DESCRIPTION	ENTRY CONDITION	REPAIR	STATUS
C TUBES	01	COMMENT: WATERSIDES NOT OPEN FOR INSPECTION, NOTED FOR INSPECTION.	NA
C1 TUBES	01	COMMENT: NO. 1 COIL HAS WELD REPAIR AT START OF FINNED SURFACES FROM THE OUTLET HEADER. NOTED FOR INSPECTION.	NA
C11 WATERSIDES	01	COMMENT: ACID CLEANED DURING OVERHAUL. NOTED FOR INSPECTION.	NA

Figure 1-10.—Sample BIRMIS report—Continued.

BOILER WATER CHEMISTRY WORKSHEET/LOG

1. Is a boiler water log maintained on a daily basis when the WHB is operating? 220-30.72

2. Are the boiler water chemistry worksheet/logs properly maintained? 220-30.72
   a. Are freshly filled and treated boilers properly handled? 220-30.36
   b. Are the required sampling frequencies being accomplished on a steaming WHB? 220-30.39
      (1) Within 30 minutes after online?
      (2) As often as required to maintain limits, but at least every 8 steaming hours?
      (3) Within 1 hour before commencing a blowdown?
      (4) 30-60 minutes after a blowdown?
      (5) 30-60 minutes after batch chemical treatment?
      (6) Within 90 minutes prior to securing?
   c. Are the WHBs under proper and authorized lay-ups and checked hourly when on a steam blanket? 220-30.56
      (1) Steam blanket lay-up (up to 30 days)
      (2) Dry lay-up (indefinite)
   d. Do the WHBs receive required blowdowns? 220-30.53
      (1) Every 24 hours when the sample contains sediment (bottom blow)
      (2) Every 168 steam hours (bottom blow)
      (3) Boiler will be secured over 2 hours (bottom blow)
      (4) Is the percentage of blowdown properly computed? 220-30.54
   e. Are the quarterly standards tests recorded on the monthly boiler data log every month? 220-27.9
   f. Are the results of the test of chemicals against standards recorded on the No. 1 WHB chemistry/log? 220-30.85
   g. Are all actions concerning the WHB indicated on the boiler water chemistry worksheet/log? 220-30.78
   h. Are all out-of-limit test results circled by the fuel and oil king? 220-27.3.1
   i. Are all out-of-limit test results that are circled by the fuel and oil king initialed by the engineer officer? 220-27.3.5

3. Does the engineering officer of the watch (EOOW) comply with all program requirements? 220-27.3.3

4. Does the LCPO review and initial the boiler water chemistry worksheet/log daily? 220-27.3

5. Does the MPA review and initial the boiler/water chemistry worksheet/log daily? 220-27.3.4

6. Does the engineer officer review and sign the boiler water chemistry worksheet/log? 220-27.3.5

Figure 1-11.—Boiler water chemistry check sheets.

FEEDWATER CHEMISTRY WORKSHEET/LOG

1. Is the feedwater log maintained on a daily basis when the system is in operation? 220-27.11

   a. Are chemical tests and salinity cell comparison tests conducted daily when the system is in operation? 220-30.18

   (1) If the chemical test result is lower than the salinity cell reading by more than 0.02 epm, is the water checked for hardness? 220-26.18

   (2) If the hardness is equal to or less than 0.02 epm, is the water being used and is the salinity indicator checked for a malfunction? 220-30.18

   (3) Are the necessary remarks annotated in the Remarks section when an unsatisfactory comparison is recorded? 220-27.16

   (4) If a salinity indicator is malfunctioning, is the water monitored every 4 hours by a sample and chemical test until the salinity indicator is repaired? 220-30.19

   b. Are the required tests (hardness, conductivity and silica) being conducted on shore source feedwater? 220-30.26

   c. Are the feedwater tanks tested daily for chloride and hardness? Table 220-67

   d. Are all actions concerning the feedwater system indicated on the feedwater chemistry worksheet/log? 220-27.11

   e. Are all out-of-limit test results circled by the fuel and oil king? 220-27.3.1

   f. Are all out-of-limit test results that are circled by the fuel and oil king initialed by the EOOW? 220-27.3.3

2. Does the LCPO review and initial the feedwater chemistry worksheet/log daily? 220-27.18

3. Does the MPA review and initial the feedwater chemistry worksheet/log daily? 220-27.18

4. Does the engineer officer review and sign the feedwater chemistry worksheet/log daily? 220-27.17

5. If a deaerated feed tank is installed, does the feedwater chemistry worksheet/log indicate a daily test for oxygen? Table 220-67

Figure 1-12.—Feedwater chemistry check sheets.

HANDOUT #1

HAZARDOUS MATERIAL SPILL RESPONSE PROCEDURES

Introduction: Because of the extremely hazardous nature of many materials used aboard ships, only trained personnel are to respond to a hazardous material (HM) spill. Personnel must be trained by division officers or supervisory personnel to clean up small spills of HM. Only appropriate material safety data sheets (MSDSs) and the hazardous material user's guide (HMUG), OPNAV P-45-110-91 June 91, are to be used to conduct training.

For descriptive purposes, the spill response procedures have been divided into nine phases:

1. Discovery and notification
2. Initiation of action
3. Evaluation
4. Containment and damage control
5. Dispersion of gases and vapors
6. Cleanup and decontamination
7. Disposal of contaminated materials
8. Certification for safe re-entry
9. Follow-up reports

Each response phase is **NOT** a separate response action entirely independent of all other phases. Several phases may occur simultaneously and may involve common elements in their operation. For example, containment and damage control may also involve cleanup and disposal techniques.

RESPONSE PHASES

1. Spill Discovery and Notification

a. Spills or potential spills of hazardous substances may be discovered by regularly scheduled inspections of storerooms and workshops, by detection devices such as fire alarms and oxygen deficiency detectors, or during routine operations. All discoveries of spills or situations that may lead to a spill must be reported **immediately** to supervisory personnel and the OOD/CDO. Crew members are **NOT** to remain in the area to investigate a spill. Whenever possible, however, the discoverer/initial response team should report:

- Time of spill discovery
- Location of spill
- Identification of spilled material
- Behavior of material (reactions observed)
- Source of spill (for example, tank or container)
- Personnel in vicinity of spill (list by name and department)
- Volume of spill
- Anticipated movement of spill (for example, leakage to lower deck passage from midships toward galley)
- Labeling or placarding information (copy data from spilled container only after exposure to spill is eliminated)

b. The commanding officer shall report all overboard spills of hazardous substances as required by OPNAVINST 5090.1A, "Navy Environmental and Natural Resources Program Manual."

Figure 1-13.—Handout #l for sample lesson plan.

2. Initiation of Action

Coordination and direction of spill response efforts at the scene of an HM spill are done by the ship's OOD, CDO, fire marshal, damage control party leader, or senior person at the scene. The coordinator of the response efforts will initiate the following actions:

a. Evacuate all personnel from areas that may be exposed to the spilled material. Especially evacuate those areas affected by vapors.

b. Block off the affected area.

c. Arrange first-aid for injured personnel.

> **CAUTION**
>
> Do NOT enter the contaminated area until the necessary protective clothing and equipment have been determined.

d. Establish a command post and communications network.

e. Prevent spills from entering other compartments by any means that does not involve personnel exposure to the spill, such as closing drains, ventilation ducts, doors, and hatches.

f. Disperse gases or vapors to the weather deck through the use of blow-out (forced exhaust) ventilation or by natural ventilation such as opening doors or hatches. If the atmosphere is suspected to be flammable or explosive, use only explosion-proof fans for blow-out ventilation.

g. Eliminate any fire or explosion hazards such as electrical equipment, incompatible materials, or open flames.

3. Evaluation

Proper evaluation of a spill can prevent fires, explosions, personal injury, or permit steps to lessen their impact. This evaluation consists of the following three steps:

a. Obtain as much information as possible from container labels and MSDS before commencing further response actions. Look for the type and concentration of the spilled material. Also look for hazardous characteristics of the spilled material. Notice and report the following information:

- Flash point
- Toxicity
- Corrosivveness
- Potentially incompatible substances
- Effects resulting from exposure (fainting, dizziness, skin or eye irritation, nausea)
- First-aid measures for exposure

b. Determine dangerous conditions or potential consequences of the spill, including:

- Fire or explosion
- Presence of oxygen-deficient atmosphere in the compartment
- Presence of toxic or explosive gases
- Possibility of dangerous vapors being drawn into the ship's ventilation system

Figure 1-13.—Handout #l for sample lesson plan—Continued.

- Other HM in the compartment that would play a role in a fire or explosion or is incompatible with the spilled material

c. Determine from the MSDS the appropriate spill response equipment and protective clothing necessary for safe and effective response

4. Containment and Damage Control

Actions taken during this phase are directed toward controlling the immediate spread of the spill and minimizing the impact to the ship and crew. Depending on the type of spill, some or all of the following procedures may be used:

a. Fight fire (if any), being careful to use fire-fighting methods compatible with the material involved.

b. Shut off or otherwise stop the spill at its source, whenever feasible, by:

(1) Replacing leaking containers

(2) Plugging leaks in tanks

(3) Emptying the tank of the remaining contents

(4) Encapsulating a leaking container into a larger, liquidtight container

c. Predict spill movement and take further action to prevent the spill from possibly entering other compartments by closing scuppers, drains, ventilation ducts, doors, or hatches.

d. Contain liquid material using barriers, such as sand, upholstery, sorbents, or other equipment suitable to dam the flow.

5. Dispersion of Gases and Vapors

If a flammable gas or vapor is released as a result of the spill, the gas/vapor must be dispersed or diluted as soon as possible. The gas/vapor must not be allowed to enter other compartments. In some cases, the explosive atmosphere can be contained and diluted to lower its concentration below the lower explosive limit (LEL). Have the gas free engineer check the spill area for LEL and toxicity. The atmosphere can then be dispersed by one of the following methods:

—Normal exhaust ventilation (explosion-proof only)

—Blow-out ventilation (powerful exhaust ventilation provided in some HM storerooms explosion-proof only)

—Doors and hatches open to the weather decks

—Portable fans (explosion-proof only)

6. Cleanup and Decontamination

During this response phase, personnel, as directed by the person in charge, will employ the spill cleanup methods recommended on the MSDS. All surfaces are to be thoroughly cleaned of the spilled material. After the spill cleanup, thoroughly ventilate the compartment. Thoroughly decontaminate reusable protective clothing and otherwise maintain it before returning it to its proper storage location.

7. Disposal of Contaminated Materials

All non-reusable cleanup materials are to be placed in impermeable containers, stored, and disposed of as hazardous waste according to Appendix B3-C of OPNAVINST 5100.19B. These materials include unrecoverable protective clothing, sorbents, rags, brooms, and containers.

8. Certification for Safe Re-Entry

The spaces affected by the spill must be certified safe by the OOD/CDO before normal shipboard operations are resumed in that space. The OOD/CDO must ascertain the following before allowing re-entry:

a. All surfaces, such as decks, counters, bulkheads, and overheads have been thoroughly cleaned of the spilled material.

Figure 1-13.—Handout #1 for sample lesson plan—Continued.

b. All compartments have been adequately ventilated as determined from analysis by the gas free engineer.

c. All contaminated cleanup materials, including protective clothing, have been packaged, marked, and handled as hazardous material.

9. Follow-Up Reports

The OOD/CDO must submit to the HM coordinator a spill report for all onboard spills. A copy of this report must be filed by the safety officer and must contain the following information:

—Date the spill occurred

—Location of the spill

—Identity of spilled material

—Cause(s) of spill

—Damage or injuries resulting from the spill

—Response and cleanup measures taken

—Any problems encountered

—Method of disposing of contaminated material

—Action taken to prevent the repeat of a similar spill

Figure 1-13.—Handout #l for sample lesson plan—Conthmed.